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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,688	09/30/2003	Michael C. Kaye	016465-022	5077

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EXAMINER
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NGUYEN, PHU K

ART UNIT	PAPER NUMBER
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2673

DATE MAILED: 06/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/674,688

Applicant(s)

KAYE ET AL.

Examiner

Phu K. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-30 is/are allowed.
- 6) ☒ Claim(s) 1,3,6 and 8 is/are rejected.
- 7) ☒ Claim(s) 2,4,5,7,9 and 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.


### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

  
PHU K. NGUYEN  
PRIMARY EXAMINER  
GROUP 2300

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/13/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 6, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by SMEULDERS et al. (Tracking Nonparameterized Object Contours in Video) in view of SELSIS et al. (Automatic Tracking and 3D Localization of Moving Objects by Active Contour Models)

As per claim 1, Smeulders teaches the claimed method comprising:

“tracking an object in an image” (Smeulders, page 1082, lines 17-22), the object having an object edge (Smeulders, the edge map, page 1083, column 2, lines 11-18) and “an object outline” (Smeulders, the object contour, page 1085, column 1, lines 34-36) thereabout, from frame to frame over a sequence of images (Smeulders, tracking results over several frames, page 1088, figure 9), and

creating object outlines in subsequent frames (Smeulders, the new contour is calculated based on the predicted contour and the detected edge map, page 1083, column 1, lines 2-5; page 1085, column 1, lines 34-36) maintaining an object outline to object edge distance spacing relationship (Smeulders, the contour is positioned at the most significant edges within the search band C, page 1084, figure 2, column 1, lines 48-50) as the object moves or changes from frame to frame (Smeulders, tracking results over several frames, page 1088, figure 9).

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It is noted that Smeulders does not teach the outlines are used "for converting two-dimensional images into three-dimensional images". However, Selsis teaches that the 2D object outlines of 2D images are converted into 3D object outlines in case of 3D stereoscopic images is well known in the art (Selsis, the 2D outlines found in the left and right 2D images are put under an epipolar constraint to convert them as the 3D outline in the 3D images; page 97, column 2, line 29 to page 98, column 1, line 2). It would have been obvious at the time the invention was made, in view of the teaching of Selsis, to configure Smeulders' method as claimed by converting the detected 2D contours of the pairs of 2D left and right images, using the epipolar constraint, into the 3D contour of the 3D stereoscopic object. The purpose of using the object outlines to convert the 2D images into 3D images is to provide a realistic 3D stereoscopic image with the object outlines are detected and reduce the complexity of the detection of outline in the 3D images (Selsis, page 98, column 1, lines 16-18).

**RESPONSE TO APPLICANT'S ARGUMENTS:**

Applicant's arguments filed April 13, 2005 have been fully considered, but they are not deemed to be persuasive.

Applicant argues that SMEULDERS et al. does not disclose or suggest "creating object outlines in subsequent frames for converting two-dimensional images into three-dimensional images..." In the rejection, Examiner clearly states that Smeulders only teaches the "creating of object outlines" (Smeulders, the object contour, page 1085, column 1, lines 34-36) and fails to teach the use of these outlines for "converting two-

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dimensional images into three-dimensional images..."; However, Examiner further indicates that "Selsis teaches that the 2D object outlines of 2D images are converted into 3D object outlines in case of 3D stereoscopic images is well known in the art (Selsis, the 2D outlines found in the left and right 2D images are put under an epipolar constraint to convert them as the 3D outline in the 3D images; page 97, column 2, line 29 to page 98, column 1, line 2); " and furthermore, states the motivation and how to combine the teachings of Smeulders and Selsis on the following paragraph; that is "it would have been obvious at the time the invention was made, in view of the teaching of Selsis, to configure Smeulders' method as claimed by converting the detected 2D contours of the pairs of 2D left and right images, using the epipolar constraint, into the 3D contour of the 3D stereoscopic object. The purpose of using the object outlines to convert the 2D images into 3D images is to provide a realistic 3D stereoscopic image with the object outlines are detected and reduce the complexity of the detection of outline in the 3D images (Selsis, page 98, column 1, lines 16-18)."

Applicant argues that SMEULDERS et al. does not disclose or suggest "maintaining an object outline to object edge distance spacing relationship as the object moves or changes from frame to frame. In SMEULDERS et al., the search band C is used in the tracking process, not to maintain (force) an object outline to object edge distance spacing relationship as the object moves or changes from frame to frame." Examiner disagrees. Smeulders' search band C maintains (or holds up) the object contour within a distance from the object edge as the object changes from frame to

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frame" (Smeulders, the contour is positioned at the most significant edges within the search band C, page 1084, figure 2, column 1, lines 48-50); therefore, the purpose of Smeulder's search band C shows the step of "maintaining an object outline to object edge distance spacing relationship as the object moves or changes from frame to frame."

Applicant argues that "SELSIS et al. discloses using an epipolar constraint to reduce the number of possible matches in the matching problem. The generalized teaching in SELSIS et al. of temporal and stereoscopic matching does not equate to a disclosure or suggestion of 'creating object outlines in subsequent frames... and maintaining an object outline to object edge distance spacing relationship as the object moves or changes from frame to frame.' Even if SELSIS et al. is properly combined with SMEULDERS et al., the collective teachings of these references, which focus on object tracking, clearly fail to disclose or suggest the subject recited in claim 1. Withdrawal of this rejection is respectfully requested." However, as stated above, the argued features have already been taught by Smeulders; and Examiner uses the Selsis references to teach what Smeulders lacks in the claimed invention, that is "the outlines are used 'for converting two-dimensional images into three-dimensional images'." (Selsis, the 2D outlines found in the left and right 2D images are put under an epipolar constraint to convert them as the 3D outline in the 3D images; page 97, column 2, line 29 to page 98, column 1, line 2). According, the combined teachings of Smeulders and Selsis has all the features of the claimed invention; and the motivation and how to combine is clearly pointed out by Examiner (It would have been obvious at the time the invention was

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made, in view of the teaching of Selsis, to configure Smeulders' method as claimed by converting the detected 2D contours of the pairs of 2D left and right images, using the epipolar constraint, into the 3D contour of the 3D stereoscopic object. The purpose of using the object outlines to convert the 2D images into 3D images is to provide a realistic 3D stereoscopic image with the object outlines are detected and reduce the complexity of the detection of outline in the 3D images (Selsis, page 98, column 1, lines 16-18).)

Claim 3 adds into claim 1 "one or more sub-objects contained within the object are defined such that the sub-objects are linked together and tracked as the object moves or changes from frame to frame" which Smeulders teaches in the head object containing the hair and the ear (Smeulders, page 1088, column 1, lines 8-18).

Claim 6 adds into claim 1 "the object outlines obey a maximum error threshold relative to an initial frame of definition" which Smeulders teaches the Search area C which is defined by the initial predicted object outline and the maximum error threshold (Smeulder, page 1083, column 2, lines 1-5; page 1087, column 1, lines 7-14).

Claim 8 adds into claim 1 "the object outlines are created employing a pixel image data tracking technique" which Smeulders teaches in the edge detection which detects the abruptly change of the pixel value or the potential present of an edge (Smeulders, page 1083, column 2, lines 11-12; page 1087, column 2, lines 31-34).



Claims 2, 4, 5, 7, and 9-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In claim 2, the allowable feature is "a virtual object corresponding to the object is defined such that the virtual object is tracked and the object outlines generated independent of whether the object is obstructed from view in a subsequent frame by another object moving into the foreground."

In claim 4, the allowable feature is "one or more points contained within the object are associated with depth information and defined such that the one or more points track the object as the object moves or changes from frame to frame."

In claim 5, the allowable feature is "one or more contour path lines contained within the object are associated with depth contour information and defined such that the one or more contour path lines track the object as the object moves or changes from frame to frame."

In claim 7, the allowable feature is "electing a severity of regulation for the distance spacing relationship to force errors in the object outlines to an acceptable tolerance."

In claim 9, the allowable feature is "the object outlines are created employing a key frame curve interpolation technique."

In claim 10, the allowable feature is "the object outlines are created employing a combination of pixel image data tracking and key frame curve interpolation techniques."



Claims 11-30 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

In claim 11, and its dependent claims 12-20, the allowable feature is "re-creating the outline in a different frame of the image sequence maintaining relative distances between the edges of the object and the outline to create a different perspective for a three-dimensional image."

In claim 20, and its dependent claims 21-30, the allowable feature is "re-creating the outline in different frames of the image sequence maintaining relative distances between the perimeter of the object and the outline to create an alternate perspective for a three-dimensional image sequence."

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu K. Nguyen whose telephone number is (571) 272 7645. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, bipin Shalwala can be reached on (571) 272 7681. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Phu K. Nguyen  
June 15, 2005

  
PHU K. NGUYEN  
PRIMARY EXAMINER  
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